

REMARKS

The applicant appreciates the Examiner's thorough examination of the application and requests reexamination and reconsideration of the application in view of the following remarks.

The Examiner rejects claims 1-3 and 9 under 35 U.S.C. §102(b) as being anticipated by Laakmann (U.S. Patent No. 3,742,234).

The applicant's claimed integrated meniscus mirror as recited in claim 1 includes:

1) an optical substrate including a mirror surface on one side and a support structure on the other, and 2) a plurality of actuators embedded in the support structure spaced from and generally parallel to the mirror surface for applying bending moments to the mirror surface for controllably altering the shape of the mirror surface. The applicant's claimed invention provides a truly improved, light weight integrated meniscus mirror that requires no reaction mass and has a good natural frequency, areal density, excursion, and correctability characteristics. The innovative design provides actuators that are characteristically easy to install and replace.

In contrast, Laakmann does not teach, suggest or disclose a plurality of actuators embedded in the support structure spaced from and generally parallel to the mirror surface for applying bending moments to the mirror surface for controllably altering the shape of the mirror surface. Instead, Laakmann teaches, suggests, and discloses actuators that are disposed perpendicular to the mirror surface and that apply motion in a direction orthogonal to the surface of the plates. The stacks of actuators (100-110) as disclosed by Laakmann are placed perpendicular to two sides of the mounting plate (67) and the two external plates (69) and (70) as shown by:

Positioned between the two plates 69 and 70 are a left-array 88 and a right-array 89 of stacks of transducers, which arrays are symmetrical relative to the mirror neutral plane 75.

Referring now also to FIGS. 6 and 7, each array forms a honeycomb sandwich of rows R-1 to R-6 on both sides of the axis 24, of stacks such as stacks 100 to 111, each stack including electro or magnetostrictive transducers such as 124 to 128 of the stack 100 and such as 115 to 124 of the stack 105.

(Col. 4, line 59 – Col. 5, line 1, emphasis added. *See also* Figs. 5-7 of Laakmann)

Proof that the transducers as disclosed by Laakmann apply motion in the direction orthogonal to the surfaces of two external plates (69) and (70) is shown by:

The transducer motion in a direction orthogonal to the surfaces of the plates 69 and 70 is proportional to the voltage per centimeter (in the direction orthogonal to the surfaces of the plates 69 and 70) times the length in the same direction of the crystal in centimeters.

(Col. 5, lines 63-68, emphasis added.)

The applicant's claimed plurality of actuators as recited in claim 1 are spaced from and generally parallel to the mirror surface. The claimed actuators apply bending moments to the mirror surface for controllably altering the shape of the mirror surface by applying bending moments parallel to the mirror surface. *See* Fig. 3 and page 7, lines 9-19 of applicant's specification.

Therefore, Laakmann does not teach, suggest or disclose each and every element of the applicant's claimed integrated meniscus mirror as recited in independent claim 1, namely, a plurality of actuators embedded in the support structure spaced from and generally parallel to the mirror surface for applying bending moments to the mirror surface for controllably altering the shape of the mirror surface. Accordingly, claim 1 is allowable and

patentable under 35 USC §102(b) over Laakmann. Because claims 2, 3, and 9 depend from claim 1, these claims are allowable and patentable under 35 U.S.C. §102(b) over Laakmann.

The Examiner rejects claims 1-3, 5, 7, 9 and 11 under 35 U.S.C. §102(b) as being anticipated by Döngi *et al.* (German Patent No. DE 19917519).

Döngi *et al.* teaches and discloses actuators disposed perpendicular to the mirror surface and that apply motion in a direction orthogonal to the mirror surface. *See* Fig. 1 of Döngi which clearly shows the actuators disposed perpendicular to the mirror surface and applying motion in a direction orthogonal to the mirror surface.

Döngi also does not teach, suggest or disclose embedding the actuators in a support structure as recited in applicant's claim 1. Instead, Döngi *et al.* teaches and discloses a mirror that includes back and front thin actuator layers (1) and (5) with several individually controllable actuator elements. The front thin actuator layer (5) is sandwiched between pressure distribution layer (6) and the front sandwich cover layer (4). Pressure distribution layer (6) is glued to front actuator layer (5). Similarly, the back thin actuator layer (1) is attached to the back sandwich cover layer (2).

Therefore, Döngi *et al.* does not teach, suggest or disclose each and every element of the applicant's invention as recited in independent claim 1, namely, a plurality of actuators embedded in the support structure spaced from and generally parallel to the mirror surface for applying bending moments to the mirror surface for controllably altering the shape of the mirror surface.

Accordingly, applicant's independent claim 1 is allowable and patentable under 35 U.S.C. §102(b) over Döngi *et al.* Because claims 2, 3, 5, 7, 9, and 11 depend from an

allowable base claim, these claims are allowable and patentable under 35 U.S.C. §102(b) over Döngi *et al.*

The Examiner rejects claim 4 under 35 U.S.C. §103(a) as being unpatentable over Laakmann or Döngi *et al.* in view of Shuskus *et al.* (U.S. Patent No. 4,444,467). The Examiner also rejects claim 10 under 35 U.S.C. §103(a) as being unpatentable over Laakmann or Döngi *et al.* in view of Alden *et al.* (U.S. Patent No. 5,074,654). As shown above, Laakmann and Döngi *et al.* either alone or in combination do not teach, suggest or disclose each and every element of the applicant's invention as recited in claim 1. The additional references cited by the Examiner also fail to disclose these features. Because claims 4 and 10 depend from allowable claim 1, the Examiner's rejection of these claims under 35 U.S.C. §103(a) is traversed.

The Examiner provisionally rejects claims 1 and 2 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of co-pending Application No. 10/946,799. In response, the applicant submits herewith a Terminal Disclaimer to overcome the Examiner's rejection of claims 1 and 2 and advance prosecution of the subject application. Both the subject application and the '799 application are commonly owned by Xinetics, Inc. The subject application was assigned to Xinetics, Inc. by virtue of the Assignment recorded at Reel 014888, Frame 0699. The '799 application is a divisional application of the subject application. Because the Assignment of the subject application carries title to all divisional applications, the '799 application is also assigned to Xinetics, Inc. Accordingly, claims 1 and 2 are allowable and patentable over the judicially created doctrine of obviousness-type double patenting.

Each of the Examiner's rejections has been addressed or traversed. Accordingly, it is respectfully submitted that the application is in condition for allowance. Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned or his associates collect in Waltham, Massachusetts, at (781) 890-5678.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'RJC', followed by a horizontal line.

Roy J. Coleman
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